



"Flight" photograph.

The Martin Navigation fleet consists of three D.H. Rapides and a Dragon

the Channel, where light vessels are few and far between, can be used. Obviously, it is far better practice for a crew to endeavour to hit a small light vessel out in the open sea than a large chunk of land. In this case, the pupils use the Owers and the Le Havre light vessels and the Island of Alderney, while the Newhaven-Dieppe, Southampton-Jersey and similar steamers are used for interception exercises.

A better idea of the sort of work carried out will probably be obtained from the description of an actual flight which we made with two Service pupils in one of the Rapides a week or two ago. In this case a trip was due to be made to Alderney. Mr. Trusk, the pilot, flew on two different courses over Worthing while the pupils took drift readings on the pier with the prismatic type of tail drift-sight. The readings were 4 deg. starboard on a course of 259 T. and 2 deg. port on a course of 39 deg. T. Rapid work with the Service type of C.S.C. showed that the wind was blowing at 7 m.p.h. from 195 deg. T. Double drift problems, incidentally, can be worked out very easily and quickly with this type of C.S.C.

### Practical Work

The wind having been estimated and allowed for, the machine flew out from Worthing at 08.26 hrs., the estimated time of arrival at Alderney being 09.33 hrs. at a set air-speed of 110 m.p.h. On the direct track the Owers light vessel lies a few miles to the south-east, and the first bit of minor trouble was encountered when this vessel passed almost directly underneath. Attempts to use the tail drift-sight on it were unavailing, and, as it seemed that the wind-speed and direction must have changed, a sea marker was thrown out through the special hatch provided for this purpose and another sight taken. These sea markers leave the machine as solid blocks of aluminium dust, but after hitting the water and returning to the surface the block has disintegrated, and the result is a useful patch of white on the sea. It is necessary to be fairly quick in using the drift sight, as the patch is soon lost, but the particular instrument used has a movable prism which can be tilted by means of knurled knobs to keep the object in view until it has almost reached the horizon. The view-finder is twisted round during the process until the selected object is travelling straight down between two grid wires, and the drift is then read off on a scale. The reading in this case showed a drift of 10 deg. to starboard,

suggesting that the wind-speed had increased, and the course was accordingly altered.

As we neared the French coast it was obvious that the weather was deteriorating rather seriously, with clouds down to 150ft. or less. A weather report from Jersey showed that the clouds would almost certainly be sitting on Alderney, and this island would not, in any case, have been seen to provide a check on the navigation. Furthermore, there were Jersey Airways machines busy on their lawful travels, and this was where experience, both in the case of the pilot and the radio operator, was of paramount importance. Mr. Trusk turned back.

As far as exercises were concerned, the only thing left to do was to work out an E.T.A. for the Owers light vessel, which at least provided a special test of ground-speed accuracy. It was estimated by the pupils that the return had been started when the machine was 24 miles from Alderney. Evidently either this or the combined calculation was suffering from an error. In due course the cloud-covered Isle of Wight came into distant view, and work with a bearing compass—for which two special sockets are provided and movable windows arranged at the rear of the fuselage—showed that we were quite near to the vessel, though the E.T.A. was still several minutes away. However, we not only passed the Owers according to plan, but we hit Shoreham more or less spot-on, so there was nothing wrong with the essential navigation.

During the last phase of the return to the Owers the radio operator had asked for bearings from both the Bristol and the Portsmouth radio stations. The QTEs, respectively 133 deg. and 174 deg., gave us a position which was patently incorrect. In each case the signals had to pass over three coast lines, and the errors were undoubtedly caused by the refraction. The pupils are taught all about the various direction-finding errors, and it might be remarked that, on paper, these appear to be so numerous that pupils can be forgiven for their tendency to be tremendously sceptical about bearings in general. Needless to say, they are not as bad as all that, but it is as well to know just what direction-finding, with or without Adcock aerials, can be depended upon to do. All four machines carry Marconi two-way equipment, and the Dragon has, in addition, a rotating loop aerial for self-navigation. The fact that this equipment is in the Dragon saddens the ground engineers, as this is shortly to be replaced by a Rapide.

### A NEW CUTTING FLUID

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The makers are Sternal, Ltd., Royal London House, Finsbury Square, London, E.C.2.